

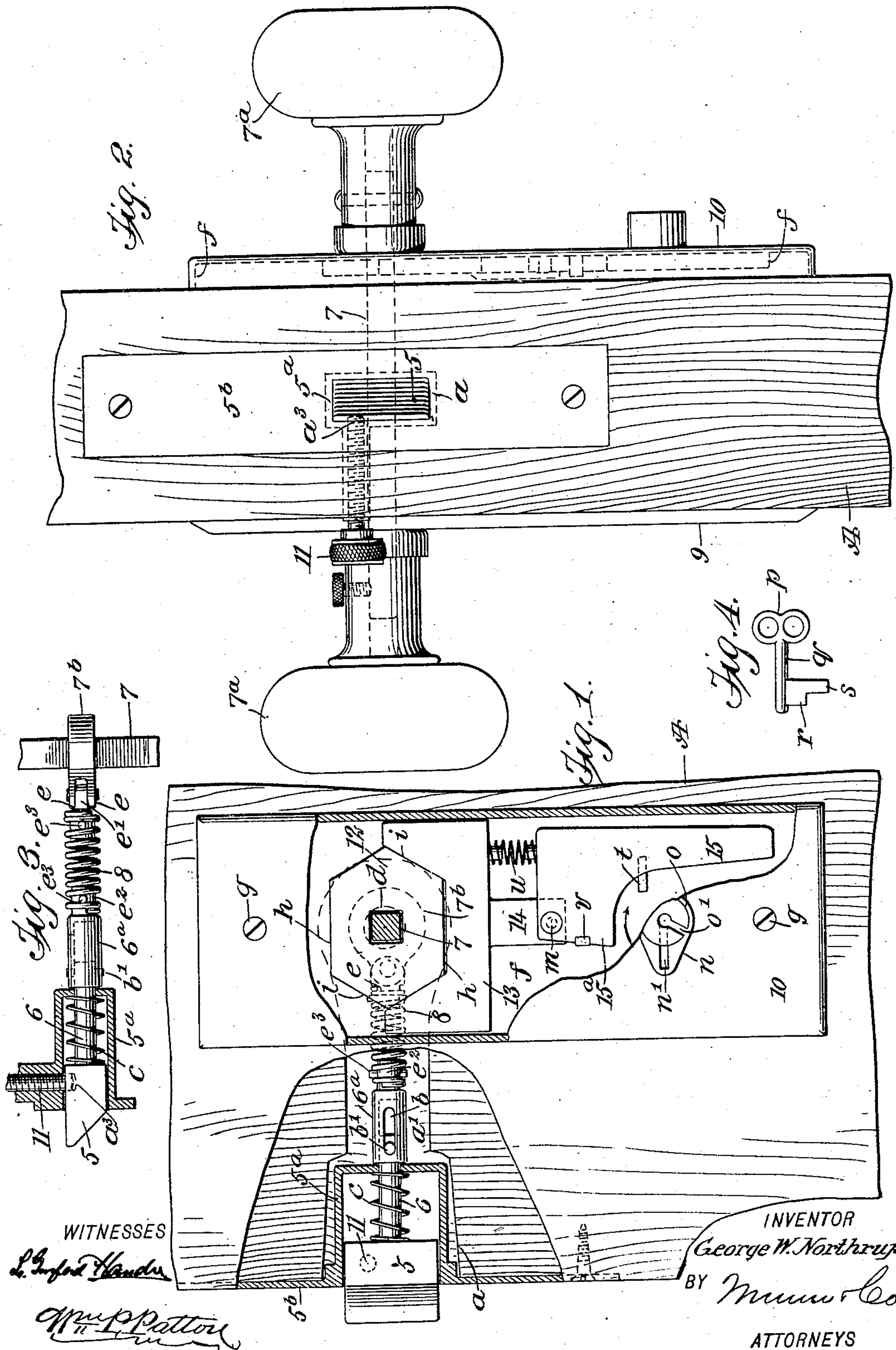
G. W. NORTHRUP.

DOOR LOCK.

APPLICATION FILED JULY 8, 1908.

929,474.

Patented July 27, 1909.





# UNITED STATES PATENT OFFICE.

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## DOOR-LOCK.

No. 929,474.

Specification of Letters Patent.

Patented July 27, 1909.

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*To all whom it may concern:*

Be it known that I, GEORGE W. NORTHRUP, a citizen of the United States, and a resident of Brainerd, in the county of Crow Wing and State of Minnesota, have invented a new and Improved Door-Lock, of which the following is a full, clear, and exact description.

This invention relates to door locks of the class known as mortise locks, which are embedded in a door by forming a recess in the body of the door from the free edge inward.

It is well known that mortise locks which contain the locking and latching mechanism, are too thick for use on a door one and one-eighth of an inch in thickness, and as this class of doors are much cheaper than heavier doors, and in many cases preferred, the ordinary cap or rim lock is substituted for a mortise lock, that is neater in design, and generally more secure in service than the rim lock.

The purpose of this improvement is to provide a door lock of novel, simple construction, which is very secure, is inexpensive, and while possessing all the advantages of a mortise lock, may be placed on thin doors, or those of greater thickness.

The invention consists in the novel construction and combination of parts, as is hereinafter described, and defined in the appended claims.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a partly sectional side view of a portion of a door, and a like view of the improved lock secured in and on the door; Fig. 2 is an edge view of the door, and a front view of the improved lock thereon; Fig. 3 is a detached, partly sectional plan view of details of the improved lock; and Fig. 4 is a side view of a key for the lock.

In the drawings, A represents a door which is exaggerated in thickness, as the lock may be mounted upon a door much thinner than that represented in the drawings.

A feature of the invention consists in adapting a latch bolt for the lock, to serve as a locking bolt also, and thus dispense with a multiplicity of parts. The latch bolt that serves a dual purpose is shown at 5 in the

drawings, and comprises a nose block having a rectangular body, and a laterally sloped outer end that in use engages the ordinary apertured strike plate, mounted upon the door casement not shown.

At a suitable point on the door A, and at its transverse center, a mortise *a* is formed therein, for reception of a guide box 5<sup>a</sup>, wherein the latch bolt 5 fits loosely, and the guide box, which has thin side walls as is indicated by dotted lines in Fig. 2, is of such lateral dimension as will permit it to be embedded in a quite thin door. The box 5<sup>a</sup> is formed or secured on a face plate 5<sup>b</sup>, that is fitted into a shallow recess in the edge of the door A, and is thereon secured. The mortise *a*, in reduced dimensions, is extended farther into the door A, as shown by full lines at *a'* in Fig. 1 and also by dotted lines in said figure, and accommodates other details hereinafter described. From the inner end and center of the nose block 5, a slide rod 6 is projected loosely through a perforation in the rear wall of the guide box 5<sup>a</sup>. Upon the extended portion of the slide rod 6, a coupling box 6<sup>a</sup> is mounted, said box having a cylindrical body and an axial bore wherein the rod 6 slides. In the defining wall of the coupling box 6<sup>a</sup>, two longitudinal slots *b* are oppositely formed, that receive a crosspin *b'*, which also extends through the end of the slide rod. On the slide rod 6, between the rear end of the nose block 5 and the rear wall of the guide box 5<sup>a</sup>, a coiled spring *c* is mounted, and as shown in Fig. 1, the force of said spring normally presses the nose block outward.

A transverse perforation *d*, shown by dotted lines in Fig. 1, is formed in the door A, and intersects the mortise extension *a'* near its inner end, said perforation receiving a knob spindle 7, which projects through the door at each side thereof, and upon its ends knobs 7<sup>a</sup> are secured in the usual way. Upon the spindle 7 and within the mortise extension *a'*, a collar, 7<sup>b</sup>, shown in dotted lines in Fig. 1 and in full lines in Fig. 3, is mounted and fitted tightly upon the squared body of said spindle. Two spaced ears *e*, *e*, project from the periphery of the collar 7<sup>b</sup>, and between them is pivoted one end of a stub shaft *e'*. A similar stub shaft *e''* extends from the inner end of the coupling box 6<sup>a</sup>, and upon said stub shaft a coiled spring 8 is mounted at its ends. In each



stub shaft,  $e'$ ,  $e^2$ , a cross pin  $e^3$  is affixed, these pins passing through transverse perforations in the shafts and between the coils of the spring near its ends, thus producing  
 5 an elastic coupling between the collar 7b and the nose block 5, which will effect the retraction of the latter when the spindle 7 is turned in either direction. Oppositely,  
 10 A, two escutcheon plates 9, 10, are respectively secured by suitable means, the spindle 7 passing loosely through opposite perforations therein. In the plate 9, which is attached upon the normally inner side of the  
 15 door A, a locking screw bolt 11 is rotatably inserted, the threaded body of said bolt being screwed through a threaded perforation in the escutcheon plate, and thence through an alined larger perforation in the  
 20 door, so that the pointed end of the screw bolt may be seated in a shallow socket  $a$  formed to receive it in the side of the nose block 5. It will be seen that upon inserting the inner end of the locking bolt 11 into the  
 25 socket in the nose block 5, the latter will be held immovable until the screw bolt is retracted so as to release the nose block.

The escutcheon plate 10, which in service is secured upon the outer side of the door  
 30 by means of screws  $g$ , is recessed deeply on the inner side thereof, as shown at  $f$  in Figs. 1 and 2, and a detent block 12 is mounted and firmly secured upon the spindle 7, and occupies the recess  $f$ . Preferably the detent  
 35 block is shaped as shown in Fig. 1, having parallel upper and lower edges  $h$  and obtuse angular end walls  $i$ . The side walls of the recess  $f$  are parallel with each other, and between said walls the parallel end walls of a  
 40 locking plate 13 are loosely fitted, so that the locking plate may be slid toward or away from the detent block. The upper edge of the locking plate 13 is shaped so as to fit upon the lower side of the detent  
 45 block. Upon the lower edge of the locking plate 13, an arm 14 is formed or secured, that projects downward, and upon the lower portion of said arm an upper corner of a flat crank-shaped tumbler 15 is lapped and  
 50 pivoted, as shown at  $m$  in Fig. 1. On the outer side of the escutcheon plate 10 a key guard  $n$  is formed at a point opposite to and properly spaced from the nearest side edge of the pendent tumbler 15, said guard  
 55 having a key slot  $n'$  formed therein. A co-operating guard plate  $o$  is rotatably secured on the guard  $n$ , having a central perforation therein which is opposite a similar one in the key guard, and from the perforation in the guard plate  $o$  a key slot  $o'$  is radially  
 60 extended therein through the outer edge thereof.

A key is provided for the control of the locking device hereinbefore described, and is  
 65 represented in Fig. 4, said key consisting of

a finger grip or bow end  $p$  from which extends a stem  $q$ , whereon two bits or flanges  $r$ ,  $s$ , are formed near the free end of the stem. The key bit  $r$  that is nearest the end of the stem  $q$ , is of a length and thickness that permits it to pass through the key slot  $o'$ , and  
 70 if the key slots  $n'$ ,  $o'$  are not alined, the key stem must be turned so as to dispose the key bit  $s$  opposite the slot  $n'$ , which will permit a complete insertion of the bits of the key into  
 75 the recess  $f$ . Upon the side edge of the tumbler 15 that is adjacent to the key guards  $n$  and  $o$ , a toe  $t$  projects therefrom, and is normally disposed in the path of the longest key bit  $s$ , and will be engaged therewith  
 80 when the key is inserted into the key guards  $n$ ,  $o$ , and turned in the direction of the arrow in Fig. 1. In a notch formed in the side edge of the member 15<sup>a</sup>, on the tumbler plate 15 below and near the pivot  $m$ , an abutment  
 85 stud  $v$  is normally seated, said stud projecting from the door, and as shown in Fig. 1. The projecting stud  $v$  when seated in the notch of the tumbler 15 holds it and the locking plate 13 elevated and the latter in en-  
 90 gagement with the detent block 12, so as to lock the spindle and thereby prevent the latch bolt from being operated. The stud  $v$  also serves as a stop to prevent the depending member of the tumbler plate from rock-  
 95 ing too close to the guards  $n$ ,  $o$ . Upon studs formed or secured on the opposing edges of the locking plate 13 and tumbler 15, a coiled spring  $u$  is mounted, which is slightly compressed, and by its tension the depending  
 100 member of the tumbler is returned to its normal upright position if rocked by the key. The locking screw bolt 11 is only inserted into the nose block 5 when the door is to be secured against opening from the outer  
 105 side, and therefore is normally retracted so as to permit a free sliding movement of the latching nose block.

In operation, it will be noted that due to the swiveled connection of the collar 7<sup>b</sup> with  
 110 the slide rod on the nose block 5, by means of the spiral spring 8 and the means for changing the length of the slide rod, the nose block is permitted to reciprocate and latch fast upon a strike plate when the door  
 115 is closed, the outward sliding movement thereof being enforced by the coiled springs  $c$  and 8.

The enforced engagement of the locking plate 13 with the detent block 12, effected by  
 120 the stud  $v$  engaging the notch of the tumbler as hereinbefore described, will prevent the turning movement of the spindle 7 from either side of the door until the detent block is released. To effect such a release, the key  
 125 hereinbefore described is inserted through the guards  $n$ ,  $o$ , and turned in the direction of the curved arrow in Fig. 1, which will cause the key bit  $s$  to impinge upon the toe  
 130  $t$  and throw the tumbler rearwardly to dis-



engage it from the stud *v*, when the tumbler and locking plate will drop by gravity, thereby disengaging the locking plate from the detent block, and permitting the spindle to be operated from either side of the door for the retraction of the nose block 5 and the consequent opening of the door, it being apparent that the manner in which the collar 7<sup>b</sup> is connected to the spring 8, will permit a sufficient lateral bending movement of the spring to be effected, for the rearward movement of the nose block into the box 5<sup>a</sup> and the clearance thereof from the door case-ment.

15 It is to be understood that the door is to be locked by the key only from the outside, it being locked from the inside by the screw bolt 11.

As hereinbefore mentioned, it will be apparent that as the box 5<sup>a</sup> is but a fraction of an inch thicker than the nose block, the mortise which is formed to receive it may be produced in the side rail of a quite thin door and thus enable the use of the improved lock upon doors of any preferred thickness.

25 Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. A lock, comprising a guide box, a latching nose block slidable in the guide box, a transverse spindle, a collar thereon, and a spring connection secured to the nose block and pivotally connected with the collar.

2. A lock, comprising a guide box, a latching nose block slidable in the guide box, a transverse spindle, a collar thereon having a projection, and a spring connection pivoted at one end on the projection and slidably secured at the opposite end to the nose block.

3. A lock, comprising a guide box, a latching nose block slidable in the guide box, a slide rod working through the rear end of the box, a spring on the slide rod pressing between the block and the end wall of the box, a transverse spindle, means for turning the spindle, a collar on the spindle, a projection on the collar, and a spring-controlled longitudinally-adjustable connection pivoted at one end on the projection and secured at the opposite end on the slide rod.

4. A lock, comprising a guide box seated in a mortise formed in the edge of a door, a latching nose block slidable in the guide

box, a slide rod secured on the rear end of the nose block and reciprocal through an end wall of the guide box, a coupling box loosely mounted upon the rear end of the slide rod, a stub shaft on the coupling box, a transverse spindle, means for turning the spindle, a collar fixed on the spindle and having a peripheral projection thereon, a stub shaft pivoted at one end on the projection, and a coiled spring loosely secured at its respective ends upon the stub shafts.

5. In a lock of the character described, the combination with a latch bolt, a spindle, and means for operating the latch bolt from the spindle, of a sliding locking plate having interlocking engagement with a member carried by the spindle, a tumbler pivotally connected to the locking plate, and means for holding the tumbler and locking plate elevated, said means being engaged and disengaged by the movements of the tumbler.

6. In a lock of the character described, the combination with a latch bolt, a spindle having a detent block thereon, means for operating the bolt from the spindle, a sliding locking plate having interlocking engagement with said block, a tumbler pivotally connected with the locking plate and provided with a notch in one edge, and a lug engaging the said notch.

7. In a lock of the character described, the combination with a door, and a recessed escutcheon plate secured on the door, of a spindle supported for turning movement in a transverse perforation in the door, means carried by the spindle for manually turning it, a detent block secured on the spindle and located in the recessed escutcheon plate, a locking plate that normally holds the detent block from rocking, a tumbler pivoted on a projection from the locking plate, a spring holding the tumbler upright, and a projection on the tumbler engageable by a key for depressing the locking plate and permitting the detent block and spindle to turn.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEORGE W. NORTHRUP.

Witnesses:

MILTON McFADDEN,  
GEO. A. KEENE.